

CLAIMS

What is claimed is:

1. A semiconductor device, comprising:
a first carrier substrate;
a first semiconductor chip mounted face down on the first carrier substrate;
a second carrier substrate;
a second semiconductor chip mounted on the second carrier substrate;
protruding electrodes for connecting the second carrier substrate to the first carrier substrate so that the second carrier substrate is held above and spaced apart from the first semiconductor chip;
a sealant sealing the second semiconductor chip; and
a resin provided between the first carrier substrate and the second carrier substrate so that the reverse face of the first semiconductor chip is exposed.
2. The semiconductor device according to Claim 1,
wherein the second carrier substrate is fixed to the first carrier substrate so as to be mounted on the first semiconductor chip.
3. The semiconductor device according to Claim 1,
wherein the sealant further comprises a mold resin.
4. The semiconductor device according to Claim 1,
wherein a position of a sidewall of the sealant coincides with a sidewall of the second carrier substrate.

5. The semiconductor device according to Claim 1,
wherein the first semiconductor chip is connected to the first carrier substrate by pressure welding.

6. The semiconductor device according to Claim 1,
wherein, at the same temperature, an elastic modulus of a semiconductor device including the first carrier substrate and the first semiconductor chip mounted on the first carrier substrate is different from an elastic modulus of a semiconductor device including the second carrier substrate and the second semiconductor chip mounted on the second carrier substrate.

7. The semiconductor device according to Claim 1,
wherein the first carrier substrate on which the first semiconductor chip is mounted further comprises a flip-chip-mounted ball grid array, and
wherein the second carrier substrate on which the second semiconductor chip is mounted further comprises at least one of a mold-sealed ball grid array and a chip size package.

8. The semiconductor device according to Claim 1,
wherein the first semiconductor chip comprises a plurality of semiconductor chips mounted in parallel on the first carrier substrate.

9. The semiconductor device according to Claim 1,
wherein the second semiconductor chip comprises a plurality of stacked semiconductor chips.

10. The semiconductor device according to Claim 1,
wherein the second semiconductor chip comprises a plurality of semiconductor chips mounted in parallel on the second carrier substrate.

11. A semiconductor device, comprising:
a carrier substrate;
a first semiconductor chip mounted face down on the carrier substrate;
a second semiconductor chip on which re-arrangement wiring line layers are formed on surfaces where electrode pads are formed; and
protruding electrodes for connecting the second semiconductor chip to the carrier substrate so that the second semiconductor chip is held above and spaced apart from the first semiconductor chip.

12. An electronic device, comprising:
a first carrier substrate;
a first electronic part mounted on the first carrier substrate;
a second carrier substrate;
a second electronic part mounted on the second carrier substrate;
protruding electrodes connecting the second carrier substrate to the first carrier substrate so that the second carrier substrate is held above and spaced apart from the first electronic part;
a sealant sealing the second electronic part; and
a resin provided between the first carrier substrate and the second carrier substrate so that the reverse face of the first electronic part is exposed.

13. An electronic apparatus, comprising:
a first carrier substrate;
a semiconductor chip mounted on the first carrier substrate;
a second carrier substrate;
a second semiconductor chip mounted on the second carrier substrate;
protruding electrodes connecting the second carrier substrate to the first carrier substrate so that the second carrier substrate is held above and spaced apart from the first semiconductor chip;
a sealant sealing the second semiconductor chip;
a resin provided between the first carrier substrate and the second carrier substrate so that the reverse face of the first semiconductor chip is exposed; and
a mother substrate on which the first carrier substrate is mounted.

14. A method of manufacturing a semiconductor device, comprising the steps of:
mounting a first semiconductor chip face down on a first carrier substrate so that the reverse face of the first semiconductor chip is exposed;
mounting a second semiconductor chip on a second carrier substrate;
sealing the second semiconductor chip with a sealing resin; and
connecting the second carrier substrate to the first carrier substrate via protruding electrodes so that the second carrier substrate is held above the first semiconductor chip so as to be separated from the first semiconductor chip.

15. The method of manufacturing a semiconductor device according to

Claim 14, wherein the step of sealing the second semiconductor chip with the sealing resin comprises the steps of:

integrally molding a plurality of the second semiconductor chips, which are mounted on the second carrier substrate, with the sealing resin; and

cutting the second carrier substrate molded with the sealing resin into pieces so that each piece includes one of the second semiconductor chips.

16. A method of manufacturing an electronic device, comprising the steps of:

mounting a first electronic part on a first carrier substrate so that the reverse face of the first electronic part is exposed;

mounting a second electronic part on a second carrier substrate;

sealing the second electronic part with a sealing resin; and

connecting the second carrier substrate to the first carrier substrate via protruding electrodes so that the second carrier substrate is held above the first electronic part so as to be separated from the first electronic part.